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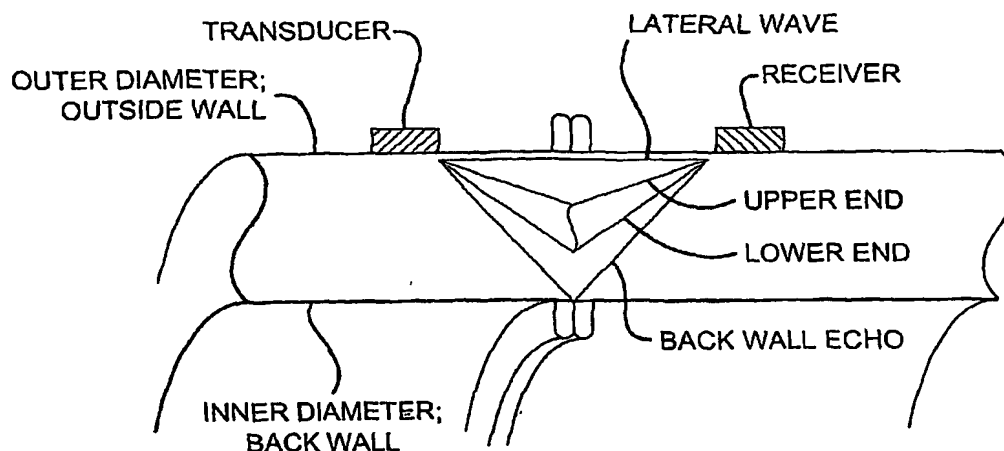
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(54) Title: CONFIGURATIONS AND METHODS FOR ULTRASONIC TIME OF FLIGHT DIFFRACTION ANALYSIS



(57) Abstract: An ultrasound test apparatus for polymeric materials (e.g., plastic pipes) includes a low-absorption housing that at least partially encloses an ultrasound transducer, wherein the transducer emits a low frequency wide angle ultrasound beam with a narrow bandwidth. In especially preferred configurations and methods, the apparatus will detect flaws in polymeric pipes, and especially in welds or stressed zones of such pipes, wherein defects of less than 4% of the wall thickness (up to 4 inches) are detected. Further disclosed are configurations and methods for non-destructive detection of lack-of-fusion defects in polymeric pipes.

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